

REMARKS

Applicants respectfully appreciate the consideration the Examiner has shown in the Advisory Action and the 3/11/2004 Interview. In the Advisory Action, the Examiner rejected Claims 24-35 and 37-40. Claims 24-35 and 37-40 remain in the case. After the interview, the Examiner acknowledged that Claims 24-35 and 37-40 are not obvious over EP 887110 in view of Chan et al. (U.S. Patent 5,441,624). Applicants have amended claims 38-40 to reflect correct numerical dependency from the appropriate claim, and to clarify matters to facilitate prosecution. The amendments are expressly not for reasons related to patentability but to correct superficial typographical error and clarify matters.

No Motivation to modify or any reasonable expectation of success in modifying EP 887110 to comprise *multiple plasma sources* in view of Chan, a *physical vapor deposition* reference.

After the interview, the Examiner acknowledged that Claims 24-35 and 37-40 are not obvious over EP 887110 in view of Chan et al. (U.S. Patent 5,441,624). As explained in the Examiner interview, one of ordinary skill in the art could not have been motivated to modify EP 887110, a *chemical vapor deposition* (CVD), in view of Chan, a *physical vapor deposition* (PVD), which is a *non-analogous prior art*, for the following reasons, which taken independently and separately are sufficient.

Chan teaches (col.3, line10 and col.12, line 34) that the substrate should not be in direct line of site of the cathode to avoid particles depositing in the coating. By doing so, Chan **actually teaches away** because in applicants' plasma process, placing substrates anywhere except in direct line of site of the source produces very poor properties.

Chan also fails to disclose where to place the plasma sources for a *CVD* process. *PVD* processes like Chan typically have a very short distance from the source to the substrate. In contrast, in applicants' CVD process and especially for complex 3D shapes, the source is much further away, typically 25cm to separate the generation of the plasma from the

downstream chemistry. Thus, Chan does not disclose where to place the plasma sources for a *CVD* process.

Chan also fails to disclose proper location of the gas reactants which are relevant to achieve both uniform coating thickness and properties in a *CVD* process. In contrast, applicants disclose gas reactants and the proper location of the gas reactants, which are relevant to achieve both uniform coating thickness and properties.

Chan also fails to disclose temperature control because Chan discloses depositing the same material as is being gasified. In contrast, in applicants' expanding thermal plasma (ETP) process, control of temperature is relevant both to achieve uniform coating properties and to control the maximum temperature that the substrate achieves.

In Chan's *PVD* process, Chan is only concerned with placing the sources to achieve uniform coating thickness. In contrast, in applicants' process, control of the gas injection especially radially from the source is relevant for good properties. In fact, the *PVD* process can also be achieved by translating a single source back and forth because the composition doesn't change radially. This is not possible in a *CVD* process because unless the next plasma source is located properly, the edges of the deposit from the first plasma do not have the right properties. Even for uniform thickness, Chan fails to disclose where to place the sources and in fact Chan Figures 7 and 8 do not show alignment to get uniform thickness because they are too far apart.

Thus, because the Chan *PVD* reference fails to address or teaches away from various issues relevant to *CVD*, Chan *PVD* reference could not possibly provide any motivation or *any* expectation of success.

No Motivation to modify or reasonable expectation in modifying EP 887110 to comprise *multiple plasma sources* to increase *area* in view of Ackerman because EP 887110 fails to disclose *multiple plasma sources* and Ackerman fails to disclose increased *area* and *multiple plasma sources in more than one direction*.


The Examiner rejected claims 24-30 and 37-40 as allegedly obvious over EP 887110 in view of Ackerman (U.S. 5,062,508). Applicants have amended claims to clarify matters and facilitate prosecution. The amendments are expressly not for reasons related to patentability.

Definiteness

Applicants have amended claims 38-40 to reflect correct numerical dependency from appropriate claim, such as amending claim 40 to depend from 37 instead of claim 40. The amendments are expressly not for reasons related to patentability but to correct superficial clerical error. Furthermore, applicants have amended claim 38 and 40 to clarify any alleged indefiniteness to further prosecution, not for reasons related to patentability.

In light of the amendment and remarks presented herein, Applicant submits that the case is in condition for immediate allowance and respectfully requests such action. If, however, any issues remain unresolved, the Examiner is invited to telephone the Applicant's counsel at the number provided below.

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